

CLAIMS

What is claimed is:

1. An automatic surgical mill, comprising a unitary casing, the unitary casing having an opening through which bone is introduced into the mill, a rotatable pulverizing cutter positioned inside a first compartment of the casing, a motor for providing a rotational force, the motor being positioned within a second compartment of the casing, and a coupling for connecting the cutter to the motor so that the rotational force provided by the motor is imparted to the particle reducer, thereby pulverizing bone introduced into the mill.
2. The mill of claim 1 wherein the mill is sterilizable and reusable.
3. The mill of claim 1 wherein the mill is non-sterilizable and disposable.
4. The mill of claim 1 wherein the cutter comprises a single pulverizing blade.
5. The mill of claim 1 wherein the cutter comprises a plurality of pulverizing blades.
6. An automatic surgical mill for pulverizing bone, comprising
a first casing member for housing a rotatable pulverizing bone cutter, the first casing member having an opening for receiving bone into the first casing member;
a second casing member selectively connectable with the first casing member, the second casing member housing a coupling;
a first sealing arrangement disposed between the first and second casing members;
a third casing member selectively connectable with the second casing member, the third casing member housing a motor; and
a second sealing arrangement disposed between the second and third casing members.
7. The mill of claim 6 wherein the motor provides a rotational force, and the motor is operatively connectable with the cutter via the coupling to impart a rotational force to the cutter.

8. The mill of claim 6 wherein the first sealing arrangement is an O-ring.
9. The mill of claim 6 wherein the second sealing arrangement is an O-ring.
10. The mill of claim 6 wherein the cutter includes a blade and a shaft extending from the blade, the shaft being adapted to extend through an opening defined in a wall of the second casing member to engage with the coupling.
11. The mill of claim 10 wherein the motor includes a shaft, the motor shaft being adapted to extend through an opening defined in a wall of the third casing member to engage with the coupling.
12. The mill of claim 11 further comprising a third sealing arrangement, the third sealing arrangement being disposed between the cutter shaft and the wall of the second casing member.
13. The mill of claim 12 further comprising a fourth sealing arrangement, the fourth sealing arrangement being disposed between the motor shaft and the wall of the third casing member.
14. The mill of claim 12 wherein the third sealing arrangement is an O-ring.
15. The mill of claim 13 wherein the fourth sealing arrangement is an O-ring.
16. A bone mill assembly, comprising an automatic surgical mill having a casing, means for receiving and housing bone in the casing, means for pulverizing bone housed within the casing, and means for removing pulverized bone from the housing.

17. The bone mill assembly of claim 16 wherein the bone mill assembly further comprises a motor, the motor being adapted to impart a rotational force to the means for pulverizing bone.

18. The bone mill assembly of claim 17 wherein the casing comprises a first portion and a second portion, the first portion being selectively connectable with the second portion, and wherein the second portion houses bone.

19. The bone mill of claim 18 further comprising a third portion, the third portion housing the motor.

20. The bone mill of claim 19 wherein the first portion is connectable to the second portion via a threaded engagement, and wherein the second portion is connectable to the third portion via a threaded engagement.

21. The bone mill assembly of claim 19 wherein at least two of the casing portions are connected together by one or more draw latches, one or more spring pins, and/or one or more plungers.

22. The bone mill assembly of claim 21 wherein the means for removing pulverized bone is a spatula.

23. The bone mill assembly of claim 18 wherein the second portion comprises a switch, the switch being engaged by the first portion when the first portion is connected with the second portion.

24. The bone mill assembly of claim 23 wherein the switch is electrically connected to a motor circuit associated with the motor, and wherein engagement of the switch renders the motor operable.

25. The bone mill assembly of claim 17 further comprising at least one multi-position switch disposed on the casing and electrically connected to the motor, the at least one multi-position switch being selectively activated to operate the motor in one of a plurality of operating modes.